

Remarks

Claims 1-70 were originally pending in this application. Claims 1-20, 30-39, 46-50, 52, and 55-61 are canceled without prejudice or disclaimer. Claims 24, 51, 54, 68, and 69 are currently amended without introducing new matter. Claims 21-29, 40-45, 51, 53-54, and 62-70 are pending for examination, with claims 21, 40, 51, 62, 68, and 70 being independent claims.

Rejection under 35 U.S.C. § 112

Claim 69 is rejected under the second paragraph of 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

Claim 69 is currently amended to correct a typographical error. No new matter is introduced.

Accordingly, reconsideration and withdrawal of the rejection under 35 U.S.C. § 112 is requested.

Rejections Under 35 U.S.C. § 102

Claims 21-26, 40-41, and 44-45 are rejected under 35 U.S.C. § 102(e) as being anticipated by the teaching of Willman et al. in U.S. Patent Publication No. US2004/0118780 (hereinafter Willman).

Applicants disagree that the teaching of Willman anticipates claims 21-26, 40-41, and 44-45. As noted previously, Willman teaches a water purification system and a method of producing high-purity, laboratory-quality water involving utilizing a reverse osmosis device. Willman further teaches utilizing a capacitive deionization module to purify the reject water stream or concentrate from the reverse osmosis device. Purified water from the module is then directed to the reverse osmosis device thereby improving the overall system water recovery rate. In FIG. 4, Willman discloses a system having a recirculation path 62 involving a pair of capacitive deionization (CDI) modules 64 and 66. Inlets 70 and 69 of CDI modules 64 and 66

are fluidly coupled to the concentrate outlet 36 of a reverse osmosis unit 18. Purified water exiting through outlets 82 and 72 of modules 64 and 66 is then delivered to the inlet of reverse osmosis unit 18. (Willman at paragraphs 0030 to 0032.) Permeate from reverse osmosis unit 18 is directed to a storage tank 26 through a three-way fitting 93. Recirculation path 92 couples permeate outlet 34 and inlet 31 of reverse osmosis unit 18. (Willman at paragraphs 0033 to 0034.) Three-way fitting 93 allows for selective coupling to the exiting permeate stream into storage tank 26 or to a product dispenser 104. (Willman at paragraphs 0035 to 0036.)

Significantly, Willman fails to disclose a treatment system comprising a reservoir system fluidly connected to a point of entry, an electrochemical device fluidly connected to the reservoir system, a point of use fluidly connected to the reservoir system, and/or an auxiliary use fluidly connected downstream of the electrochemical device.

As previously noted, Willman discloses a system comprising a reverse osmosis unit, with a pore-less membrane, disposed between a feed water source and a storage tank. Because the reverse osmosis unit utilizes a pore-less membrane, the storage tank cannot be fluidly connected to the feed water source. Stated plainly, the pore-less membrane fluidly isolates the storage tank from the feed water source. Thus, Willman fails to disclose a treatment system comprising a reservoir system fluidly connected to a point of entry.

Willman further fails to disclose a treatment system comprising an auxiliary use, or even an auxiliary use fluidly connected downstream of the electrochemical device. As noted on page 16 of the present specification as originally filed, discharge water from a waste stream can be delivered to an auxiliary use to provide additional or secondary benefits. Thus, instead of being discharged to a drain, the waste stream can be used for irrigation purposes. Willman, in contrast, fails to recognize such utility and, as is conventional in the field, discharges the waste stream to drain 22.

Thus, independent claim 21 cannot be anticipated by the teaching of Willman because this reference fails to disclose each and every limitation recited therein.

Claims 22-26 depend from independent claim 21. These claims also cannot be anticipated by the teaching of Willman for at least the reason recited above. Indeed, Willman fails to disclose a treatment system comprising a pressurized reservoir system, a pretreatment system comprising reverse osmosis device, and/or a controller for regulating at least one operating parameter of the treatment system. Although Willman discloses a pump 16 that

delivers water to be treated to reverse osmosis unit 18, there is no teaching or suggestion that storage tank 26, or the contents thereof, is pressurized. This is significant in view of Willman's teaching that the pump simply serves to provide an adequate driving force for the operation of the reverse osmosis unit, without any teaching as to condition of the high-purity water in storage tank 26. (Willman at paragraph 0018 to 0019.) Indeed, no teaching or suggestion has been set forth indicating that the storage tank must necessarily be pressurized. To be sure, no explanation has been set forth that a person skilled in the art would recognize that the storage tank is pressurized beyond mere probability or possibility and it is equally likely that the contents of storage tank 26 is under atmospheric pressure, and flow to the product dispenser is facilitated by a hydrostatic head.

Further, because Willman teaches utilizing a reverse osmosis unit as a primary treatment unit operation, there can be no teaching of a system that utilizes a reverse osmosis unit in a pretreatment stage.

Willman also fails to disclose a method of treating water comprising at least one or more acts of introducing water from a point of entry to a reservoir system, removing at least a portion of any undesirable species from the water in the reservoir system in an electrochemical device to produce treated water and discharge water, transferring at least a portion of the treated water from the electrochemical device to the reservoir system, transferring a portion of the discharge water to an auxiliary use, and distributing a portion of the treated water from the reservoir system to a point of use. Thus, independent claim 40 also cannot be anticipated by the teaching of Willman.

Dependent claims 41 and 44-45 depend from independent claim 40. These claims also cannot be anticipated by the teaching of Willman for at least the same reasons discussed above. Moreover, Willman fails to teach the limitations respectively recited in these dependent claims.

Claims 51-54, 62, 65, and 68-70 are rejected under 35 U.S.C. § 102(b) as being anticipated by the teaching of Hirayama et al. in U.S. Patent No. 6,461,512 (hereinafter Hirayama).

To facilitate prosecution of this application, dependent claim 52 is canceled without prejudice or disclaimer. Thus, the rejection with respect to this claim is moot.

Applicants disagree that Hirayama discloses each and every limitation recited in independent claim 51.

Hirayama teaches a method of disinfecting a conventional treatment apparatus that produces high quality deionized water. (Hirayama at column 2, lines 24 to 29.) The disclosed apparatus utilizes a reverse osmosis device 5 between a raw water source and an electrodeionization device 6. (Hirayama at FIGS. 1a, 1b, 2a, 2b, and 3 and at column 1, lines 18 to 26.) Hirayama, however, fails to teach or suggest that any of tanks 1 and 7 accumulate water from a water source at a pressure that is above atmospheric pressure. Indeed, in each and every embodiment disclosed by Hirayama, a pump P0, or P2, is disposed to withdraw water from tank 1 or 7, respectively. The disclosed configurations further militate against any notion that any of tanks 1 and 7 must necessarily accumulate water at a pressure that is above atmospheric pressure. To be sure, however, Hirayama also fails to disclose a water treatment system comprising, inter alia, a household water distribution system.

Thus, independent claim 51 cannot be anticipated by the teaching of Hirayama because this reference fails to disclose each and every limitation recited therein.

Dependent claims 53 and 54 depend from independent claim 51. For at least the same reasons mentioned above, these claims also cannot be anticipated by the teaching of Hirayama as well as for the limitations respectively recited therein. For example, Hirayama does not teach a treatment system comprising a means for adjusting an operating parameter of at least one of the electrochemical device, means for accumulating water, and a household water distribution system. Although Hirayama discloses, at Example 1, not applying an electric current through an electrodeionization apparatus, such a condition cannot be considered as a means for adjusting an operating parameter at least because no structure has been disclosed and because there is no indication as to how any operating parameter is adjusted.

Hirayama also fails to teach each and every limitation recited in independent claims 62, 68, and 70. For example, Hirayama fails to teach a method of treating water comprising accumulating water from a point of entry at a pressure that is above atmospheric pressure. As noted above, although Hirayama discloses a method of disinfecting deionized water having tanks 1 and 7, no teaching or suggestion has been particularly identified to support the notion that the tanks are necessarily used to accumulate water at above atmospheric pressure. Again, because all of Hirayama's disclosed embodiments include pumps having a suction side directly connected

to a tank, no inference can be attributed to the assertion that the tanks necessarily accumulate water at above atmospheric pressure. Analogously, Hirayama fails teach a system comprising a pressurized fluid reservoir in thermal communication with a heat exchanger as well as a method of facilitating water comprising treatment providing a system pressurizable reservoir system. Thus, the teaching of Hirayama cannot anticipate any of independent claims 62, 68, and 70.

Dependent claims 65 and 69 depend from independent claims 62 and 68, respectively. The teaching of Hirayama also cannot anticipate these dependent claims for at least the reasons discussed above.

Claims 62, 65-67, 69 and 70 are rejected under 35 U.S.C. § 102(e) as being anticipated by the teaching of Willman.

As noted above, Willman fails to teach a pressurized reservoir system. Thus, Willman fails to disclose a method of treating water comprising accumulating water at above atmospheric pressure. Moreover, because the pore-less membrane of reverse osmosis unit 18 fluidly isolates feed water source 24 and storage tank 26, Willman cannot teach a step of accumulating water from a point of entry at a pressure that is above atmospheric pressure. Indeed, Willman also fails to disclose a step of transferring at least a portion of the accumulated water to an electrochemical device. Therefore, independent claim 62, as well as dependent claims 65-67, cannot be anticipated by teaching of Willman because the reference fails to teach each and every limitation respectively recited therein.

Dependent claim 69 depends from independent claim 68. As noted above, Willman fails to disclose storing or accumulating any fluid at a pressure that is at above atmospheric pressure. Thus, Willman fails to teach each and every limitation of independent claim 68 because there is no teaching, or suggestion, for a pressurized fluid reservoir. Moreover, Willman fails to teach a heat exchanger or even a pressurized fluid reservoir in thermal communication with a heat exchanger. Therefore, because independent claim 68 cannot be anticipated by the teaching of Willman, dependent claim 69 also cannot be anticipated by the teaching of this reference.

Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 102 is requested.

Rejections Under 35 U.S.C. § 103

Dependent claim 26 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the teaching of Willman in view of the teaching of Rela in U.S. Patent No. 6,607,668 (hereinafter Rela).

Applicants disagree that dependent claim 26 would have been obvious over the teaching of Willman in view of the teaching of Rela.

The rejection is improper because no prima facie case of obviousness has been set forth since the references fail to teach or suggest all the limitations recited in dependent claim 26. As noted above, Willman fails to teach each and every limitation recited in independent claim 21, from which dependent claim 26 depends. Rela fails to teach each of the missing limitations. Thus, dependent claim 26 would not have been obvious over the teaching of Willman in view of the teaching of Rela because any alleged combination of the references would fail to disclose each and every limitation recited therein.

Dependent claims 27 and 42 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the teaching of Willman in view of the teaching of Sato et al. in U.S. Patent No. 6,733,646 (hereinafter Sato).

Applicants disagree that claims 27 and 42 would have been obvious over the teaching of Willman in view of the teaching of Sato.

The rejection is improper because no teaching, suggestion, or motivation has been set forth to utilize the systems or methods of Willman and/or Sato to provide treated water to an appliance and/or a household. Moreover, these claims depend from independent claims 21 and 40, respectively, which as noted above, cannot be anticipated by the teaching of Willman. Sato fails to compensate for the deficiencies of Willman. Thus any combination of the teachings of these references would fail to disclose each and every limitation recited in dependent claims 27 and 42.

Further, no teaching or suggestion has been properly set forth to modify the teaching of Willman in the manner claimed to produce treated water for household use, e.g., in an irrigation application. As noted, Willman discloses a water purification system and method for producing high-purity, laboratory-quality product water. (See Willman at Abstract and at paragraph 0006.)

Sato similarly seeks to produce ultra pure water. (See, for example, Sato at Column 1, lines 5 to 8 and at column 2, lines 17 to 21.) In passing, Sato mentions that deionized water can be used for household purposes; an ordinarily skilled artisan, however, would not have utilized the systems and techniques disclosed by Willman and Sato, alone or in combination, because both references are directed to producing ultra pure water or high purity, laboratory quality product water. (See Sato at column 2, lines 6 to 8 and at column 2, lines 17 to 21; and Willman at Abstract and at paragraph 0006.) Significantly, Sato repeatedly emphasizes that the water produced by the disclosed system provides ultra pure water, without any teaching or suggestion that the produced ultra pure water can be suitable for household use. Indeed, the prosecution history of Willman provides compelling evidence that an ordinarily skilled artisan would realize the differences in requirements between water for ultra-pure purposes and water for purposes which do not require high purity. In particular, Willman notes that high purity water is produced to meet standards set forth under ASTM D1193, which distinguishes it over non-high purity water. (See Amendment in U.S. Patent Publication No. 20040118780, filed January 7, 2005, at pages 11 to 12.) Thus, it is clear that ultra pure water differs from water for household use. In view of the explicit stated objects of the teachings of Willman and Sato, i.e., to provide ultra-pure water, no prima facie case of obviousness can be made. Stated plainly, one skilled in the art would not have modified the teaching of Willman, which is directed to producing high purity water, and modify it to produce water for household use because the water quality requirements of each differ significantly. Therefore, the combined teachings of Willman and Sato cannot teach, suggest, nor would have resulted in a system comprising an appliance or a method comprising distributing treated water in or to a household.

Dependent claim 28 is rejected under 35 U.S.C. § 103(a) as being unpatentable over the teaching of Willman in view of the teaching of Hirayama.

Applicants disagree that dependent claim 28 would have been obvious over the teaching of Willman in view of the teaching of Hirayama.

As noted above, Willman fails to disclose each and every limitation of independent claim 21, from which claim 28 depends. Hirayama fails to cure the deficiencies of Willman. Thus, any proposed combination would likewise fail to teach each and every limitation of dependent claim 28.

The alleged prima facie case of obviousness is also improper because no teaching or motivation has been properly set forth to utilize the heat exchanger of Hirayama in the system disclosed by Willman. Indeed, incorporating the heat exchanger of Hirayama in the system disclosed by Willman would unduly require further experimentation and/or would run contrary to the teachings of the references.

Hirayama teaches heating water prior to the reverse osmosis unit and prior to the electrodeionization device. Separate heat exchangers are required because, unlike the reverse osmosis unit, the disclosed electrodeionization device cannot tolerate elevated sanitization temperatures. To be sure, Hirayama thermally “de-couples” these unit operations by introducing one or more intermediate unit operations therebetween to prevent damage to the electrodeionization device. In FIG. 4 of Willman, however, the CDI device is used to directly treat a reject stream from the reverse osmosis unit. This configuration thermally couples the CDI device to the RO unit, which would lead to damage of the CDI device if water heated to a temperature necessary to disinfect the RO unit is thereafter introduced into the CDI device. Thus, one skilled in the art would not have utilized the heat exchanger as disclosed by Hirayama in the system disclosed by Willman because the ordinarily skilled artisan would have recognized the potential for damage to the electrochemical devices in the system of Willman if the system could have been modified to incorporate a heat exchanger in thermal communication with a reservoir system.

Dependent claims 29 and 43 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the teaching of Willman in view of the teaching of Arba et al. in U.S. Patent No. 6,398,965 (hereinafter Arba).

Applicants disagree that dependent claims 29 and 43 would have been obvious over the teaching of Willman in view of the teaching of Arba.

There is no teaching or suggestion in the references to utilize water as an auxiliary use, which as noted above is typically discharge water from a waste stream of the electrochemical device. Thus, the prima facie case of obviousness is improper.

Significantly, Arba teaches producing highly purified water. (Arba at column 1, lines 7 to 10.) In particular, Arba teaches systems and techniques that produce sterile, purified and/or sterile water for injection water or tissue irrigation. To be sure, the water for irrigation produced

according to the teaching of Arba cannot be from a waste stream because it would be unsuitable to irrigate tissue. In contrast, the invention as claimed in dependent claims 29 and 43 is directed to utilizing waste streams to irrigate, for example, vegetation, which does not implicate any purity or sterilization requirements.

Further, claims 29 and 43 depend from independent claims 21 and 40, respectively. As noted above, claims 21 and 40 cannot be anticipated by the teaching of Willman because the reference fails to teach each and every limitation respectively recited therein. Arba fails to teach all of the missing limitations. Therefore, claims 29 and 43 would not have been obvious over the teaching of Willman in view of the teaching of Sato because the rejection is improper for failing to properly set forth a prima facie case of obviousness since the alleged combination would fail to teach each and every limitation respectively recited in the claims.

Dependent claims 63 and 64 are rejected under 35 U.S.C. § 103(a) as being unpatentable over the teaching of Hirayama in view of the teaching of Sato et al. in U.S. Patent No. 6,733,646 (hereinafter Sato).

Applicants disagree that dependent claims 63 and 64 would have been obvious over the teaching of Hirayama in view of the teaching of Sato.

These dependent claims depend from independent claim 62. As noted above however, independent claim 62 cannot be anticipated by the teaching of Hirayama because the reference fails to teach each and every limitation recited therein. Sato fails to cure the deficiencies of Hirayama. Thus, even if the teachings of the references could have been combined, which Applicants do not concede, any alleged combination would likewise fail to recite each and every limitation dependent claims 63 and 64. Therefore, claims 63 and 64 would not have been obvious over the teaching of Hirayama in view of the teaching of Sato because the rejection is improper for failing to set forth a prima facie case of obviousness.

Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103 is requested.

Conclusion

In view of the foregoing Amendments and Remarks, this application is now in condition for allowance. A notice to this effect is respectfully requested. If the examiner believes that the application is not in condition for allowance, the examiner is requested to call Applicants' attorney at the telephone number listed below.

If this Response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicants hereby request any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 50/0214.

Respectfully submitted,
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